J. M. WHITCOMB.

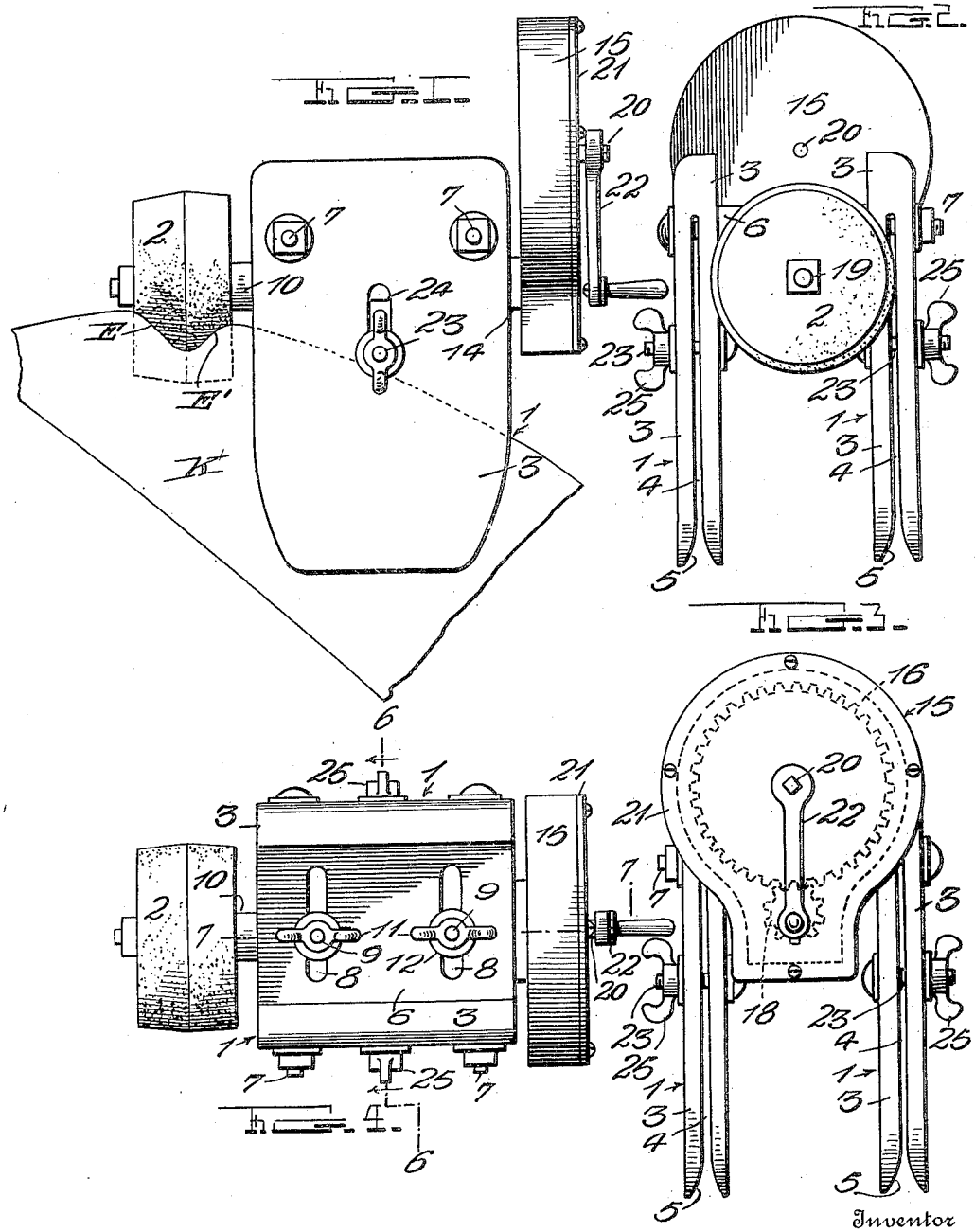
DEVICE FOR SHARPENING BAND CUTTING KNIVES.

APPLICATION FILED APR. 2, 1914.

1,104,592.

Patented July 21, 1914.

2 SHEETS—SHEET 1.



Witnesses

H. Woodard

E. Marshall

Inventor

John M. Whitcomb

By A. Bruesonte

Attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

J. M. WHITCOMB.

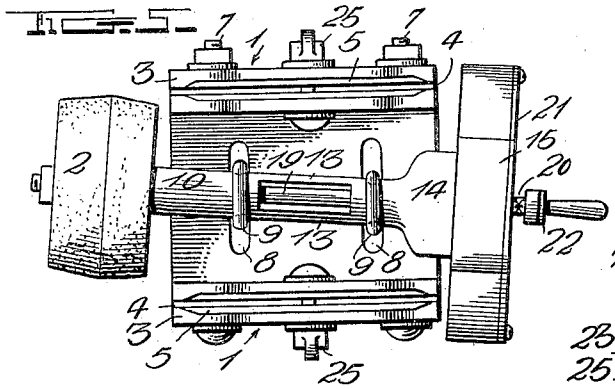
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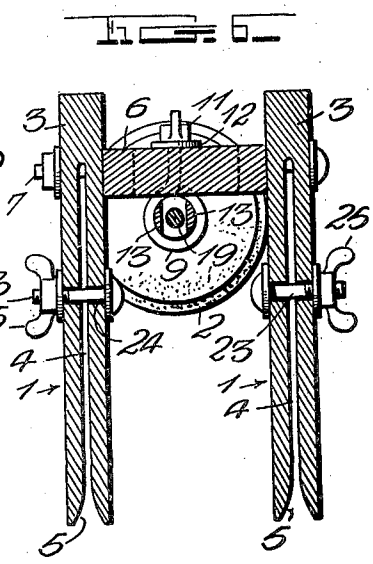
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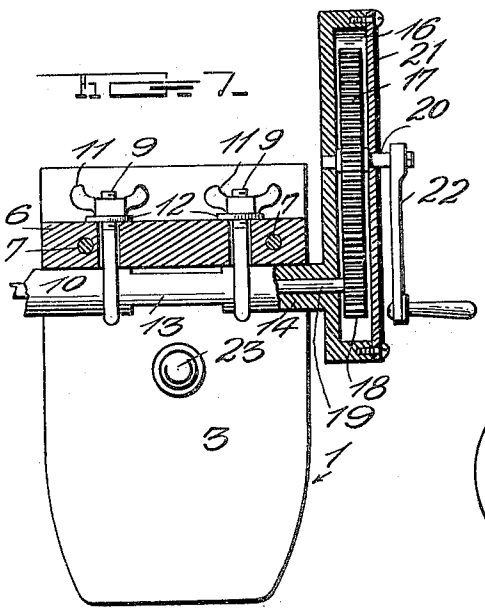
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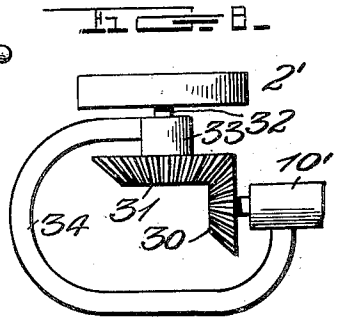
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2 SHEETS—SHEET 2.









Inventor

John M. Whitcomb

Witnesses

H. Woodard

By H. B. Williamson & Co

Attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN M. WHITCOMB, OF REDWOOD FALLS, MINNESOTA.

DEVICE FOR SHARPENING BAND CUTTING-KNIVES.

1,104,592. Specification of Letters Patent. **Patented July 21, 1914.**

Application filed April 2, 1914. Serial No. 829,051.

To all whom it may concern:

Be it known that I, JOHN M. WHITCOMB, a citizen of the United States, residing at Redwood Falls, in the county of Redwood and State of Minnesota, have invented certain new and useful Improvements in Devices for Sharpening Band Cutting-Knives; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in grinding machines and is primarily designed for the purpose of grinding or sharpening the form of band cutting knife shown and described in my U. S. patent application Serial No. 811,055, filed Jan. 8, 1914.

The primary object of the invention is to provide a simple and efficient device of this character, which may readily be employed upon band cutting knives, without the necessity of removing the same from the shaft upon which they are mounted.

A secondary object is to provide simple and efficient means for clamping the machine upon said knives, said clamping means being so disposed as to allow the same machine to sharpen both sides or edges of said knives.

Still another object is to provide means for rendering the grinding wheel adjustable toward or away from the knife being sharpened, said means being so constructed as to allow the axial relation of said grinding wheel with said knife to be varied.

With the above objects in view, the invention resides in certain novel features of construction and combination herein described and claimed and shown in the drawings wherein—

Figure 1 is a side elevation of a portion of a band cutting knife showing the application of my invention thereto; Figs. 2 and 3 are end views of the opposite ends of the machine; Fig. 4 is a top plan view; Fig. 5 is a bottom plan view; Fig. 6 is a vertical section on the line 6—6 of Fig. 4; Fig. 7 is a longitudinal section on the line 7—7 of Fig. 4; and Fig. 8 is a side elevation showing a slightly different form of construction.

In the accompanying drawings, I have shown my improved grinding machine as comprising a pair of upright clamps 1, a grinding wheel 2, means for driving said wheel and means for supporting the same in such a manner as to render it adjustable toward or away from either side of the machine and to also allow its axial relation with the knife being ground, to be quickly and easily varied.

Each clamp 1 is preferably in the form of an upright plate 3, said plates being provided with vertical slits 4 which extend from their lower edges to suitable points near their upper ends, said slits forming two pairs of parallel clamping plates each pair of which constitutes a clamp 1. The material on the opposite sides of each slit 4 is rounded as shown at 5 for the purpose of facilitating the passage of the clamps over the knife blade to be sharpened. The plates 3 are connected near their upper ends, by means of a transverse bearing supporting plate 6, said plate 6 being either formed integrally with the plates 3 or separately therefrom and secured in position by means of transversely extending bolts 7, the latter form being illustrated in the drawings. As clearly shown in Figs. 4 and 5, the plate 6 is provided with a pair of transversely extending slots 8, the latter being here shown as disposed near the opposite ends of said plate and in parallel relation.

Depending loosely through the slots 8, is a pair of eye bolts 9, the eyes of said bolts lying beneath the plate 3 and encircling a tubular bearing 10, while the shanks of said bolts are provided with wing nuts 11, said nuts being located above the plate 3 and bearing normally upon washers 12 which overlie the slots 8. For the purpose of obviating the use of unnecessary material and thereby giving useless weight to the machine, I preferably notch the upper and lower sides of the tubular bearing 10 thus providing a pair of arms 13 for connecting the opposite ends of said bearing. One end of the bearing 10 is provided with a head 14 from which rises a supporting plate 15, the latter being recessed on its outer side as shown at 16 for the reception of a driving gear 17 and a pinion 18. The pinion 18 is rigidly secured on one end of a shaft 19, being revolubly mounted in the tubular bearing 10 and having on its opposite end the grinding wheel 2, the latter being here shown in the proper shape for grinding the cutting edges E and E′ of my improved band cutting knife K.

The gear 17 is rigidly keyed to a stub shaft 20 which is journaled at its opposite

ends through the supporting plate 15 and through a cover plate 21 which is placed over the recess 16 and is secured in position in any suitable manner. The outer end of the shaft 20 is provided with a suitable crank 22 for the purpose of rotating the gear 17 which, being in mesh with the pinion 18, will drive said pinion, the shaft 19 and the grinding wheel 2.

The operating of the form of the invention, so far described, is as follows: The machine is placed upon the knife to be ground, in such a manner that the upright clamping plates of one of the clamps 1 formed by the slits 4, will straddle said blade but in such a position as to allow the cutting faces E and E′ to protrude into the path of the grinding wheel 2. The clamping plates of the active clamp 1, may now be brought into binding contact with the opposite sides of the blade K by means of a clamping bolt 23 which extends through registering slots 24 formed in said plates, the outer end of said bolt being provided with a wing nut 25. It may here be stated that this clamping mechanism (the bolt 23 passing through the slots 24 and the clamping nut 25) is duplicated on the opposite side of the machine, in other words, upon the opposite clamp 1. With the parts in this position, the wing nuts 11 may be loosened whereupon the tubular bearing 10 and the parts carried thereby, may move until the grinding wheel 2 stands at the proper angle to the blade K. This adjustment having been made, said nuts 11 may again be tightened and the parts will be rigidly clamped in proper position. The crank 22 may now be turned in a clockwise direction, this direction of movement imparting a counter-clockwise motion to the grinding wheel 2 thus causing its working face to move toward the edges of the cutting faces E and E′ and thus preventing said edges from being turned. When one side of the blade has been sharpened, the entire machine is removed from said blade and the clamp at the opposite side of the machine is secured in position upon said blade. The tubular bearing 10 is now shifted in such a manner as to cause the grinding wheel 2 to contact with the opposite side of the blade from that which has previously been sharpened. Thus it will be seen that I have provided a simply constructed device which will effectually grind or sharpen both sides of the band and cutting knife K.

The application of the invention need not be limited to its use for the purpose of grinding knives of the specific character above described, since it is obvious that a great number of grinding wheels of various sizes and shapes could be applied to the end of the shaft 19 thus rendering the device readily applicable for numerous other purposes.

In Fig. 8, I have shown a side elevation of a slightly different form of the invention. In carrying out this structure, I provide a bevel gear 30 in place of the grinding wheel 2, said bevel gear meshing with a similar gear 31 which is carried rigidly upon the lower end of an upright shaft 32, the latter being revolubly mounted in a bearing 33 carried on the upper end of an arm 34 which is secured at its lower end to one end of the tubular bearing 10′, said shaft carrying a grinding wheel 2′ upon its upper end. The remainder of the structure illustrated in this figure, is identical with the structure previously described and further description and illustration thereof is not thought to be necessary. Instead of forming the clamps in the above described manner, I may if desired, form each one of said clamps of separate plates spaced at their upper ends to produce the equivalent of the slits 4. In either case, I have found it of advantage to provide the slots 24 for the reception of the clamping bolts 23 since, by the provision of said slots, said clamping bolts may be moved into close proximity with the edge of the knife K thus increasing the clamping power of said bolts and their nuts.

I have described my invention with considerable minuteness, and have suggested alterations which might well be made and without departing from the spirit of the invention. It will clearly be understood however, that I do not wish to be limited to the above described features of construction other than as pointed out in the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A grinding machine comprising an upright clamp, a bearing supported by said clamp, a shaft revolubly mounted in said bearing, a grinding wheel operatively connected to one end of said shaft, means for rotating the shaft and means for permitting said bearing to be adjusted toward or away from said clamp and for varying the axial relation of said bearing in respect to said clamp.

2. A grinding machine comprising a clamp composed of a pair of upright clamping plates, means for moving said plates toward each other, a bearing support projecting laterally from one of said plates, a bearing carried by said support, a shaft revoluble in said bearing, means carried by said bearing for rotating said shaft, means for permitting the axial relation of said shaft in respect to said clamp to be varied, and a grinding wheel driven by said shaft and movable with said bearing.

3. A grinding machine comprising a clamp composed of a pair of upright clamp-

ing plates, means for moving said plates toward each other, a bearing support projecting laterally from one of said plates and having a pair of laterally extending slots, a bearing in contact with one side of said support, adjusting bolts projecting from said bearing through said slots, nuts on said bolts, a shaft revoluble within said bearing, means for rotating said shaft and a grinding wheel driven by said shaft.

4. A grinding machine comprising a clamp composed of a pair of upright clamping plates having alined slots, a clamping bolt passing through said slots, a nut on said bolt, a bearing supporting plate extending laterally from one of said plates and having a pair of parallel laterally extending slots, a bearing sleeve in contact with one side of said bearing supporting plate, adjusting bolts carried by said sleeve and projecting through said slots, nuts on said adjusting bolts, an upright support on one end of said sleeve, a shaft revoluble within said sleeve, a grinding wheel driven by one end of said shaft, a pinion on the opposite end of said shaft, a gear revolubly mounted on said upright support and in mesh with said pinion, and means for rotating said gear.

5. A grinding machine comprising a pair of spaced upright clamps each comprising outer and inner clamping plates connected at their upper ends, a bearing supporting plate connecting the upper ends of said clamps and having a pair of parallel laterally extending slots, a bearing sleeve in contact with one side of said bearing supporting plate, adjusting bolts carried by said sleeve and projecting through said slots, nuts on said adjusting bolts, an upright support on one end of said sleeve, a shaft revoluble within said sleeve, a grinding wheel driven by one end of said shaft, a pinion on the opposite end of said shaft, a gear revolubly mounted on said upright support and in mesh with said pinion, and means for rotating said gear.

6. A grinding machine comprising a pair of spaced clamps, a bearing support connecting said clamps and having parallel lateral slots, adjusting bolts projecting through said slots, a bearing supported by said bolts, a shaft revoluble in said bearing, means for driving said shaft and a grinding wheel driven by said shaft.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN M. WHITCOMB.

Witnesses:
DAVID MCNAUGHTON,
H. W. WARD.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."